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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

CLEVELAND, MICHAEL B

ART UNIT PAPER NUMBER

1762

DATE MAILED: 12/11/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/782,072

Applicant(s)

LIOU ET AL.

Examiner

Michael Cleveland

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5, 9 and 10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 9-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11/14/2003 has been entered.

Claim Rejections - 35 USC § 112

2. The previous rejections under 35 USC 112, 2nd paragraph are withdrawn in view of the amendments to remove the indefinite term "high".

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-5 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It is unclear whether the phrase "for an ozone generator electrode" in claim 1 requires the tube to be an ozone generator electrode or not. If it does, claim 9 would fail to further limit the parent claim. Accordingly, for the purposes of applying art, claim 1 has been treated as inclusive of the possibility that the tube is not an ozone generator electrode.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fefferman (U.S. Patent 3,653,946, hereafter '946) in view of Fitch (U.S. Patent 2,984,575, hereafter '575),

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Leinkram et al. (U.S. 3,607,379, hereafter '379), and Kurschner et al. (U.S. Patent 5,795,841, hereafter '841).

Claims 1 and 4: '946 teaches a method of gilding a ceramic substrate, such as alumina (col. 4, lines 33-35), which comprises:

- preparing a coating material which contains gold (col. 2, lines 58-75);
- cleansing the substrate (col. 3, lines 13-16), which may be alumina (col. 4, lines 33-35);
- brushing (i.e., smearing) the prepared coating material on the substrate to form a film thereon (col. 3, lines 18-22);
- drying the substrate after brushing on the coating material (col. 3, lines 22-24);
- baking the substrate at a temperature of 427-1054 °C to form a gold film (col. 3, lines 30-col. 4, line 15);
- and cooling the substrate to room temperature (col. 3, lines 69-75).

'946 does not explicitly teach A) a tubular substrate, B) drying the cleaned substrate, C) inspection of the substrate to see if the film is free of defects, D) the particularly claimed baking time and temperature, and E) retrieval of the tube after the temperature in the stove is below 110 °C.

A) '946 does not teach that the substrate is tubular. However, '575 teaches that decorative gold coatings may be provided for tubular ceramic substrates. See, for example, col. 12, lines 5-21, which demonstrate tubular substrates including a tumbler, a bottle, and a tube. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the method of '946 on a tubular ceramic substrate to have provided a decorative coating for the substrate because '946 teaches a method of applying adherent gold coatings on ceramic substrates and '575 teaches that decorative gold coatings are desired on tubular ceramic substrates.

B) '946 does not explicitly teach drying the cleaned substrate. However, the examiner takes Official Notice that it is well known to dry substrates between cleaning and coating steps. For example, Leinkram et al. (U.S. 3,607,379), col. 1, line 73-col. 2, line 15, is cited as demonstrating drying a substrate between steps of cleaning and applying a metal. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to

have dried the substrate after cleaning it because such is a conventional step in the deposition of metals onto cleaned ceramic substrates.

C) '946 does not explicitly teach inspection of the substrate to see if the film is uniform and free of defects. However, it is extremely well known to inspect a completed product to determine if it is satisfactory. For instance, '575 teaches that after the gold films are formed, they are observed, and the quality of the film is judged (col. 12, lines 1-22). In addition, '946 teaches that defects, such as bubbles and blisters, are undesirable. Taking the references as a whole, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have inspected the films to judge the quality (i.e., uniformity) and to have evaluated whether such defects existed in order to have determined if the products would have been suitable.

D) '946 does not specifically teach baking at 780-880 °C. However, the disclosed baking range (427-1054 °C, discussed above) overlaps the claimed range. The baking times of '946 are less than the claimed times. However, '946 discloses that an adherent gold coating is desired (Title) and indicates that further baking may strengthen the bond of gold to the substrate (col. 4, lines 3-15). However, '841 teaches that the adhesion of metals, such as gold (col. 1, lines 10-19 and col. 2, lines 1-4), to ceramic substrates, such as alumina or quartz (col. 1, lines 50-65) may be improved by heating at 200-1000 °C for 0.5 to 24 hours. The heat treatment temperatures and times overlap the claimed ranges. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have selected a temperature and time form within the claimed ranges because '841 discloses that they are operative for increasing the adhesion of metals to ceramics. The subject matter as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made to have selected the overlapping portion of the range disclosed by the reference because overlapping ranges have been held to be a *prima facie* case of obviousness, see *In re Malagari*, 182 U.S.P.Q. 549.

E) '946 does not explicitly state that the substrate is removed from the stove after the temperature has been reduced to room temperature. However, it does teach that the cooling of the substrate should be controlled in order to reduce stress (col. 3, lines 69-72). The Examples indicate that this may be done by leaving the substrate in the furnace (i.e., stove) until a certain temperature is reached (col. 4, lines 46-51; col. 5, lines 1-12). The substrate may be removed at

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approximately 200 °C. The teaching at col. 5, lines 10-12 makes it appear that the substrate may also be left in the oven until it reaches room temperature.

7. Claims 2-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fefferman '946 in view of Fitch '575, Leinkram '379, and Kurschner '841 as applied to claim 1 above, and further in view of Chow et al. (U.S. Patent 5,759,230, hereafter '230).

'946, '575, and '841 are discussed above, but teach the use of gold resins rather than gold chloride as a precursor for the gold film. However, '230 teaches that metal films may be made from metal precursor solutions including those of metal chlorides (col. 1, lines 6-8; col. 2, line 57-col. 3, line 10). Gold (III) chloride (AuCl_3) is specifically disclosed as an operative precursor in Table I. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used gold (III) chloride as the gold precursor in place of the gold resins of '946 with the expectation of similar results because '230 teaches that it is also able to be decomposed to form a gold film.

The references do not explicitly teach that the concentration of the precursor is 10-11%. However, '841 suggests a precursor concentration of 0.01-2% (col. 2, lines 46-48), '575 appears to teach the use of about 10 weight % of the gold precursor (Examples IX and X), '946 teaches the use of about 20% of the gold precursor (col. 4, lines 22-62), and '230 teaches the use of about 0.3-6 % of the gold precursor (Table I; the examiner assumed that the solution density was approximately that of the solvent, ethylene glycol: 9.31 lb./gal.). Taken collectively, the references suggest precursor concentrations of 0.01-20%. The subject matter as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made to have selected the overlapping portion of the range disclosed by the reference because overlapping ranges have been held to be a *prima facie* case of obviousness, see *In re Malagari*, 182 U.S.P.Q. 549.

Claim 3: '946 and '575 do not explicitly state that the substrate is kept at room temperature for 30 minutes after the coating material is smeared on. However, normally objects such as tumblers and glasses are kept at room temperature between uses, and it is frequently more than 30 minutes between uses of a tumbler. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have kept a substrate, such as a

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tumbler, at room temperature for at least 30 minutes after the film was formed (and therefore after the coating material was smeared on) as part of the normal use of a tumbler.

Claim 4: 12 hours is within the time range disclosed by '841, as discussed above.

Claim 5: '946 does not explicitly teach removing the substrate at less than 100 °C and cooling it at room temperature. However, the examples teach removing the substrate at about 200 °C (col. 4, lines 46-50; col. 5, lines 4-6) or room temperature (col. 5, lines 10-12), thereby teaching an effective range of room temperature to 200 °C. The subject matter as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made to have selected the overlapping portion of the range (just above room temperature to 100 °C) disclosed by the reference because overlapping ranges have been held to be a *prima facie* case of obviousness, see *In re Malagari*, 182 U.S.P.Q. 549.

8. Claims 1, 9, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wainright (U.S. Patent 5,052,382, hereafter '382) in view of Fefferman (U.S. Patent 3,653,946, hereafter '946), Fitch '575, Leinkram '379, and Kurschner '841.

'382 teaches a gold-coated silica tube for use as an electrode in an ozone generator (col. 3, lines 11-53), but does not teach a method of making the electrode. Therefore, one of ordinary skill in the art would have been motivated to have looked to the related art for methods of forming gold on ceramics such as silica.

'946, '575, '379, and '841 teach such a method, as discussed above. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the method of '946, '575, '379, and '841 as the particular method of forming the electrode of '382 with a reasonable expectation of success because '946, '575, '379, and '841 teach operative methods of depositing gold on ceramics.

9. Claims 2-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wainright '382 in view of Fefferman '946, Fitch '575, Leinkram '379, and Kurschner '841, as described above regarding claim 1, and further in view of Chow '230 for substantially the same reasons described above regarding claims 2-5.

Response to Arguments

10. Applicant's arguments filed 11/14/2003 have been fully considered but they are not persuasive.

Applicant's arguments regarding the criticality of the temperature ranges are unconvincing because they are not commensurate in scope with the claims and particularly not commensurate with the claims that do not specify the use as an ozone generator. Applicant points to passages that state that the coating adheres well, but there is no indication that coatings prepared with other baking times and temperatures do not so adhere. The argument is also unconvincing because the claims do not require using the product as an electrode in an ozone generator, nor would the proposed claims, because they do not require an active step of using the product as an electrode in an ozone generator.

Applicant argues that the phrase "after reaching 1200 °F, the substrate is allowed to cool slowly through normal radiation to room temperature (3 hours)." does not suggest retrieving the tube after the temperature in the stove is below 110 °C and putting the tube under room temperature." The Examiner disagrees. The substrate must be under room temperature (which is below 110 °C) if it cools to that final value, and the entire passage from lines 4-12 indicates that the substrate is not disturbed during cooling. Therefore, the passage suggests retrieving the tube from the furnace only after room temperature is reached. (Applicant has traversed the examiner's conclusion of the previous two sentences, but the traversal is unconvincing because Applicant has not pointed out the specific language of the cited passage which indicates that the tube is removed before room temperature is reached. No traversal under this grounds can be convincing without such an indication and a clear explanation of why one of ordinary skill in the art would have made that interpretation.) Further, the references makes no indication that the exterior of the furnace is kept at a temperature other than room temperature, and therefore retrieving the substrate would also necessarily be putting it under room temperature. The examiner notes that Applicant has not provided any alternate interpretation of the passage that does not meet Applicant's claim limitation.

The arguments in the affidavit are mere assertions that are unsupported by evidence. Further, Applicant's arguments in paragraphs III and IV state that temperatures outside the claimed range may lead to inferior results (emphasis added by examiner). There is no showing

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of the conditions which lead to the inferior results. Applicant's arguments in paragraph III also do not represent a comparison with the closest prior art, which demonstrates retrieving the articles at 200 °C and room temperature. Finally, there is no statement that the difference in results would have been unexpected by one of ordinary skill in the art. If Applicant submits evidence demonstrating the criticality of the claimed baking range, the claims must be commensurate in scope with the showing of evidence.

Applicant's arguments regarding the attached photographs are unconvincing because there is not a complete description of the conditions under which they were produced, and therefore there is no demonstration that they are present with the claims. Because the photographs are not part of a sworn affidavit nor the sworn application, they do not constitute evidence. Applicant's arguments from p. 9 (first full paragraph) through p. 11 are therefore unsupported by a showing of fact.

Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Cleveland whose telephone number is (571) 272-1418. The examiner can normally be reached on Tuesday-Friday and alternate Mon, 8-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive Beck can be reached on (571) 272-1415. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.



Michael Cleveland
Patent Examiner
December 6, 2003